Canadian International Food Security Research Fund (CIFSRF) - Contribution Analysis

Country Report

Scaling Up Pulse Innovations for Food and Nutrition Security in Southern Ethiopia (IDRC project #107984)

Scaling Up Pulses in Ethiopia

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Acknowledgments & disclaimer

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That said, the arguments and opinions presented here, as well as any errors and omissions, are those of the authors alone and do not necessarily represent the views of Hawassa University, IDRC, or the University of Saskatchewan.

Abbreviations

BCC	Behaviour Change Communications
CIFSRF	Canadian International Food Security Research Fund
HEW	Health Extension Worker
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
NGO	Non-governmental organisation
ODI	Overseas Development Institute
PHH	Post-Harvest Handling
SARI	Southern Agricultural Research Institute

SNNPR	Southern Nations, Nationalities, and People's Region
SUP	Scaling Up Pulses project
ToC	Theory of Change

Executive Summary

This report presents the findings of a rapid assessment designed to analyse the contribution of the *Scaling Up Pulse Innovations for Food Security* project to the production and consumption of pulses in seven zones and 15 districts of the Southern Nations, Nationalities, and People's Region (SNNPR) of Ethiopia. The project is one of 18 supported by the IDRC under the Canadian International Food Security Research Fund of which six were selected for contribution analysis.

The project sought to address the protein-calorie deficit identified in SNNPR through two mechanisms: the introduction of high-yielding, high-protein chickpea and haricot bean varieties through double cropping; and teaching improved food preparation techniques, primarily to women, in order to improve the diets of rural households through the consumption of readily-available plant proteins. The combination of these interventions sought to increase protein and calorie intake, resulting in improved nutrition and health.

In CIFSRF Phase I, the project generated a portfolio of successful innovations and technologies (including improved pulse varieties and better processing techniques and farming practices) to increase pulse production levels. This Phase ended in March 2015. Phase II started in April 2015, with the aim of bringing the research results and innovations from Phase I to a greater number of farmers and rural households.

This fits well with government priorities: the second Ethiopian Growth and Transformation Plan (GTP2) has set a target of increasing the average productivity of chickpea from the current 1.91 to 2.8 tons per ha.

The contribution analysis detailed in this document looks at the logic of this research-for-development project and presents the causal chain from the project activities, capacity changes, and behaviour change to intended results, following the framework developed by John Mayne (Mayne 2008). Data for this analysis was generated through focus group discussions, field observations, semi-structured interviews, and desk reviews of project documents and publications.

For the first theory of change that seeks to increase pulse production among SNNPR's smallholder farmers, the main activity was training farmers in the production of the selected, improved bean and chickpea varieties through the government extension system and existing farmers' groups. Extension agents collaborated with farmers' groups and model farmers to disseminate improved cultivation techniques and varieties. Farmers chosen for seed production were trained in additional post-harvest handling skills to ensure seed quality.

Over 51,000 farmers were reached with these activities and relationships were built with Guts Agro, a private sector processor, to guarantee their supply chain and to provide a market for pulse producers. These activities resulted in the intended capacity changes: farmers expressed their appreciation for the training provided in improved farming techniques as this allowed for more productive uses of their land, leading to yield increases. Thus, the expected behaviour changes were achieved: farmers produced a greater quantity of improved pulses and reported consuming some of the extra produce. Respondents spoke of seeing an improvement in their own and their family's health and incomes, as well as improvements in soil fertility, as a result of increasing their pulse production and consumption.

Some seed producers experienced difficulties marketing their produce as South Seed Enterprise often did not visit farmers directly after harvest, forcing farmers to sell their seed into the food supply chain, which meant losing the premium commanded by seeds.

Here the project trained women in the importance of pulse consumption for their family's health and taught various recipes and preparation techniques suitable for children and the whole family. Again, the project made good use of local government structures, namely health extension workers (HEW), to bring nutrition education and pulse preparation techniques to rural women.

Participants in our focus group discussions confirmed that the project had brought about the intended capacity changes by raising awareness of the nutritional benefits of pulses, making them more widely available, and providing new, more easily digestible recipes. The expected behaviour changes were achieved, with women reporting an increase in the quantity of pulses consumed by their households and visible improvements in their children's health.

The behaviour changes reported by farmers and women who attended the nutrition training have a high likelihood of being sustained, as they do not depend on external resources. Pulse producers should be able to sustain yield increases, provided they suffer no major shocks, and many spoke of expanding the area of land they had under pulses to increase their incomes further.

Likewise, those trained in the use of pulses are motivated to continue applying their knowledge as they have seen improvements in their children's health. The only hurdle identified to sustaining changes in eating behaviours is the additional water required to soak and cook pulses.

Despite the project's best efforts – for example by preparing easy-to-use manuals for extension staff – it is less clear whether the changes within the health and

agriculture extension systems can be sustained, given the high levels of staff turnover. This means that future generations of farmers and women may not benefit from similar levels of support.

The project was able to reach a large number of farmers due to its commitment to partnership with government bodies responsible for health, agriculture and gender. The efforts made to build relationships, in particular with extension services, allowed for the scaling up of the project and for its reach to be expanded very effectively.

The project was successful in achieving its food and nutrition goals. Farmers in project areas reported increasing their production of pulses and women in these same communities spoke of having learned about the importance of consuming these products, rather than simply selling them. Given the significant increases in pulse production made possible by the project, households also reported additional earnings from their pulses, which they could put towards general household expenditures (on health, education, or food) but also towards farming investments.

The project also contributed to increasing the sustainability of agricultural production in SNNPR, by ensuring that the improve pulse varieties bound as much nitrogen as possible. The project, therefore, contributed to improving and maintaining soil fertility in the region.

Finally, the project also created meaningful changes in the lives of women in its intervention areas in a number of ways. It provided small seed packages so that women could experiment with pulse production on the little land available to them. Where possible women were also involved in their production on a larger scale, if they could put 0.25 ha or more towards pulse production. Finally, they were the main beneficiaries of the nutrition component.

The project owes some of its success to the very fruitful collaboration between the University of Saskatchewan and Hawassa University; together, the two universities developed and disseminated improved pulse varieties and created the content of the nutrition curriculum. Both universities stressed that the partnership was successful because each brought expertise in a different area and so the two partners learned from each other.

From the beginning, this project has involved a wide variety of stakeholders from government, business and academia to ensure the sustainability of the project. One of the results of this has been to move pulses up the government agenda, paving the way for the production of pulses to be scaled up in other parts of Ethiopia

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Overview

Colour coding:

Unsatisfactory: very little achieved	Some gains, but achieved less than expected	Some progress: about half of what was expected	Largely successful: most objectives achieved	Highly successful: all objectives achieved, in some cases by more than expectations

	Ethiopia – Scaling Up Pulse Innovations	
Project activities, deliverables and results		
Theory of change	Improved pulse production leads to soil fertility, better nutrition, higher incomes and increased pulse seed availability	Improved mother and child nutrition through preparation of pulse-based recipes and complementary feeds for children
Activity	Team highly engaged in building partnerships necessary to reach beneficiaries; active problem-solving where farmers experience problems (e.g. pest/disease). 51,068 farmers reached (42% female), with 3,324 organised into 665 seed producing clusters.	Team highly engaged: building relationships and collaborating actively with a wide range of stakeholders. 23,059 members of farming households have benefited from nutrition education, cooking demonstrations and skills training for mothers (99.3% female).
Changes to capacity, behaviour	Producers acquire skills to produce pulses to increase their income and improve their nutrition	Women acquire skills to process pulses into nutritious meals and complementary feeds and are motivated to improve children's nutrition
Results	Improved soil fertility, increased output, increased protein consumption	Women produce complementary feeds and new pulse recipes
Impact	Increased protein consumption will improve nutrition; improved soil fertility will increase output further still	Increased protein consumption for women and children will lead to better health outcomes
Sustainability and scaling up		
Sustainability	High for behaviour changes; lower for maintaining capacity in agricultural extension service	High for behaviour changes; lower for maintaining capacity in health extension service
Scaling up	Farmers sharing knowledge and seeds with each other; can easily be scaled up further through extension service	Women sharing knowledge with each other beyond project scope; possibility of scaling up further through adoption of curriculum by Ministry of Health
Specific outcomes		
FSN	Increased consumption of pulses and with improved cooking techniques. Endline surveys showed knowledge and practice of pulse consumption and processing was significantly increased among female participants. Fathers' involvement in nutrition education was also shown to be effective for increasing mother's knowledge of nutrition. More than 35,000 consumers used ready-to-eat, pulse-incorporated complementary food products.	
Income	Pulse production has, according to farmers, resulted in higher incomes. According to project research, in Sodo and Wolayita district extra income for chickpea farmers was 3,500 Birr. Women involved in sale of Guts Agro produce increased their incomes.	
Sustainable agriculture	Pulse production and better farming techniques promise to improve soil fertility. Project has focused on teaching the value of good farming practices and inoculants, both of which improve soil fertility and increase yields (tripling yields for chickpeas). The introduction of chickpeas as a double crop was especially important to increase production and reduce risk of crop failure.	
Gender	Women are primary beneficiaries of nutrition training; involved in pulse production but usually put smaller pieces of land to their production than do men. 30 women are involved in a micro-franchise programme to sell pulse-food products produced by Guts Agro worth 50,000 Birr.	

Unexpected findings	Extent of stated desire by farmers to increase land under pulse production
Research Partnership and Policy Influence	
Research partnership	Very active collaboration between Hawassa and Saskatchewan Universities, initially in the discipline of soil science but now assisting by building capacity in nutrition. Students trained at MSc leve (15 students in soil, agronomy, nutrition, food science and agribusiness) and PhD level (1 in nutrition, 1 in food science at HU). Mutual learning for soil scientists and nutritionists at both institutions.
Research contribution to policy or wider results	A lot of interaction with policy makers and some success at moving pulses up the agenda in the Ministry of Agriculture; great interest in the Ministry of Health (Nutrition Department) to continue with training of women in nutrition/recipes. Regional Pulse Innovation Platform established in December 2015 and links developed with national platforms since.

1. Introduction

1.1 Purpose of report

This report presents the findings of a rapid assessment designed to analyse the contribution of the *Scaling Up Pulse Innovations for Food Security* project to the production and consumption of pulses in seven zones and 15 districts of the Southern Nations, Nationalities, and People's Region (SNNPR) of Ethiopia. The project is one of 18 supported by the IDRC under the Canadian International Food Security Research Fund of which six were selected for contribution analysis: Cambodia home gardens, Colombia improved yellow potatoes, Ethiopia pulses, India small millets, Nepal sustainable agriculture kits, and Tanzania fortified sunflower oil.

The Canadian International Food Security Research Fund (CIFSRF) was designed to address global problems of food and nutritional insecurity through applied, collaborative, results-oriented research. CIFSRF is a program of Canada's International Development Research Centre (IDRC) undertaken with the financial support of the Government of Canada, provided through Global Affairs Canada. Phase 1 (2009-2014) focused on testing innovations, while Phase 2 (2013-2018) aims to both test scaling up methods/mechanisms and to scale up practical solutions to: increase food production, raise income for farming families, and improve nutrition. The emphasis in Phase 2 was to harness the best of the private, public and not-for-profit sectors to expand CIFSRF's research portfolio so innovations reach more people and have a greater impact globally to improve food security.

CIFSRF set the parameters of the Phase 2 research projects by requesting certain similar elements, such as a need to have: a team of diverse partners (including at least one private sector or business partner, at least one Canadian partner and at least one developing country partner) in order to scale up pilot-tested agricultural innovations; a scaling up plan; a business model with a proof of concept and value proposition; a gender strategy; rigorous research plan and methodology to test the scaling up; policy uptake plan; as well as a comprehensive exit strategy. All projects needed to address the three cross-cutting themes of the program: gender equality, environmental sustainability, and good governance. While the project were autonomous, the strategic calls allowed for a level of consistency across the projects

While 18 projects were funded as independent projects in CIFSRF Phase 2 through competitive calls, the projects received significant group training and capacity building from IDRC over their duration, including specific workshops and mentoring on: scaling up, research methodology, gender integration, communications, and monitoring and evaluation. The overall quality of the various project strategies (e.g. scaling strategy, gender strategy, etc.) was not consistent across projects, reflecting the variable capabilities in each project team. IDRC Program Officers provided specific support on the development and implementation of these strategies, through workshops and direct technical advice. The group workshops facilitated by IDRC also allowed opportunities for cross-project collaboration and the sharing of lessons.

This project was implemented in SNNPR as the region has one of the highest incidences of protein-calorie and micronutrient deficiencies in the country. Previous research has established that the region has high potential for pulse production while the research and extension system has done little to promote their production.

The project seeks to address the identified nutritional deficits through two mechanisms: the introduction of high-yielding, high-protein chickpea and haricot bean varieties through double cropping; and teaching improved food preparation techniques, primarily to women, in order to improve the diets of rural households through the consumption of readily-available plant proteins. The combination of these interventions is expected to improve protein and calorie intake, resulting in improved nutrition and health.

Scaling Up Pulse Innovations for Food Security (SUP) is the outcome of a long-standing research partnership between the University of Hawassa and the University of Saskatchewan. The haricot bean and chickpea varieties disseminated by the project were identified and tested through participatory field trials with farmers in earlier phases of the project. Similarly, the nutrition component of the project builds on lessons learned previously and focused on scaling up its impact through wider dissemination. The research project studied the impact of the scaling-up mechanisms used as well as the value chain for beans and chickpeas, in an effort to render project gains as sustainable as possible.

1.2 Aims of the study

The Ethiopia project was selected for this contribution analysis as the project has been identified as particularly successful by the Canadian International Food Security Research Fund (CIFSRF) team at IDRC. This contribution analysis proposes to look at the logic of the research-for-development program set out and follows the causal chain from the project activities, capacity changes, and behaviour change to intended results, following the framework developed by John Mayne (Mayne 2008). It also considers any underlying assumptions and alternative explanations for the project's success. Based on this analysis, the contributions made by the SUP project to observed changes can be determined. The overall aim of this analysis is to evaluate results as far as possible towards food security impacts, characterize the nature and extent of the contribution claimed, whether scaling happened or not, and to build a performance story of why it is reasonable to assume that the actions of the CIFSRF program have contributed to the results. The study also teases out any indirect or unintended benefits or negative externalities of the project.

As this report is part of a wider review of projects funded under the second Phase of the CIFSRF, it follows the same structure as the other country case studies: it begins by describing the research method and available evidence. The second section details the logic and theories of change of the two key project elements, before testing these. The final section looks at the sustainability and scaling-up potential of the project and also assesses the contribution made by the project to changes seen.

1.3 Research Methods

Six projects, including Scaling Up Pulse Innovations, were purposely selected from the portfolio of CIFSRF Phase II projects to draw out the lessons in the areas of nutrition, food security and sustainable agriculture from some of the most successful projects.

The data for this case study was primarily generated in the course of two weeks of fieldwork in Ethiopia in October and November 2017. The research was conducted by the two authors of this report, one of whom is a member of ODI staff and the other an independent consultant based in Addis Ababa, with considerable logistical support from the University of Hawassa.

In the course of this research, the team met with members of the implementing organisations (Hawassa University, health and agriculture extension workers), smallholder farmers and members of women's nutrition groups, seed purchasers, and community leaders. In addition, we sought out civil servants and employees of NGOs working in the areas of health, nutrition and agriculture to better understand the project's environment. Discussions with interviewees were informed by the project's theory of change and focused on the motivations, opportunities and capabilities framework developed by John Mayne (Mayne, 2008).

The data collection tools used were:

- *Focus Group Discussions* were the principal instrument for data gathering from female and male farmers. Women farmers that had exposure to nutrition and pulse preparation training formed a separate group. Similarly, chickpea seed producers and chickpea farmers were consulted separately. A total of 9 FGDs were conducted in six districts purposely selected based on discussions with project staff.
- *Field observation:* the study team visited chickpea fields that were in different stages of production: land preparation or planting. Clustered fields, where 4 or 5 farmers had combined their land to produce pulses, were also visited.
- *Semi-structured interviews:* project staff (including chair of the Steering Committee), and regional and federal level partners were interviewed. These included the Bureau of Agriculture, Bureau of Health, Southern Agricultural Research Institute, and South Seed Enterprise. The team also held discussion with Hawassa University Students engaged in researching chickpea. At federal level, one research partner (ICRISAT) and one private sector partner (Guts Agro PLC) were interviewed.
- *Desk review of project documents and publications:* project documents and various publications that documented project results were reviewed as part of the contribution analysis.

For a list of individuals and institutions consulted see appendix 1.

2. Review of the Project

The overall objective of the project is to provide food and nutrition security to smallholder farmers through pulse innovations. The specific objectives are:

- To develop sustainable pulse production and associated seed production and delivery systems in 15 woredas (districts) of SNNPR;
- To identify, test and promote various scaling up/out approaches and incentives for wider impact;
- To expand the use of pulses in household-level food preparation and commercial production of pulse-cereal complementary foods;
- To create capacity and improve women farmers' access and control over resources;
- To enhance women farmers' participation, productivity, income and nutritional status through the introduction of recipes for complementary feeding;
- To develop and facilitate tailored communication strategies and innovation platforms for policy action in scaling up of pulse innovations; and
- To develop and expand the capacity of partners in integrating agriculture and nutrition.

In Phase I, the project generated a portfolio of successful innovations and technologies (including improved chickpea and bean varieties and better processing techniques for both pulses); methodologies and farming practices with potential to greatly improve food security on a large-scale in the districts where it was implemented. Phase I was completed in August 2014. Phase II started in March 2015, with the aim of bringing the research results and innovations from Phase I to a greater number of farmers and rural households.

The Scaling Up Pulse Innovations for Food Security (SUP) was implemented in SNNPR, which with a population of 17.9 million is the third most populous following Oromia and Amhara regions.[1] Chickpeas are an important source of protein in southern Ethiopia and over the years improved varieties have been released by research centres (e.g. Kabuli type), but farmers have largely continued to use local varieties (known as desi type).

Ethiopia in general and the region in particular, has suitable agro-climatic conditions for the production of both types of chickpeas. Hence, participatory variety selection was one of the methods used to evaluate varieties through involvement of users (Goa, 2017) with a view to finding locally acceptable, high-yielding, high-protein and nitrogen-fixing pulses, in collaboration with smallholder farmers, households and consumers.

The project aims fit well with government priorities: the second Ethiopian Growth and Transformation Plan (GTP2) has set a target of increasing the average productivity of chickpea from the current 1.91 to 2.8 tons per ha. This target is still lower than the 6.1 tons per ha achieved in Israel which is believed to be the highest in the world. GTP2 also aims to increase the total production of chickpeas from the current 0.45 million tons to 0.69 million tons by 2020 (Kassie, et.al. 2009; MoA, 2010).

Phase I involved participatory variety selection, where 30 farmers, of both genders, were asked to score between 8 and 10 varieties of pulses according to various criteria, ranging from seed size to yield. Each variety was scored twice, during production and after harvest, to ensure that not only production criteria but also cooking quality and ease were considered. From these scores an aggregate was calculated and a preferred variety selected for distribution to farmers in the region.

During Phase II, the project expanded the production of selected common bean and chickpea varieties across eight districts in southern Ethiopia by moving into seed production. This was done through the establishment of numerous specialized seed producing farmers (one for each five surrounding farms). In addition, farmers across these eight districts have been provided with mini-packs of improved seed (2kg) and bio-fertilizer, on the condition that they pass 2kg of seed from their harvest on to another farmer (SAIFood, 2016).[2]

Finally, the second component of the project seeks to improve the nutritional status of rural women and children. This is done by teaching improved nutrition, in particular recipes for the use of chickpeas and beans, to

[1] http://www.ethiovisit.com/southern-nations-nationalities-and-people-(snnpr)/74/ (accessed 25.11.17)

[2] http://www.saifood.ca/pulses-southern-ethiopia/ (accessed 25.11.17)

women to increase protein consumption by members of their household.

2.1 Theories of change

Two theories of change (ToCs) – one for production and another for nutrition interventions – guide the contribution analysis. The key dimensions of the ToCs are as follows:

- The enabling environment for the project, which includes government policy, non-government and private sector investments that have the potential to facilitate or hinder project implementation. These are represented in the left-hand column.
- The intervention narrative is represented by the middle column and has three levels: direct benefits (divided between results and impacts), behaviour change, and capacity change (which has four dimensions capabilities, opportunities, motivation and reach). The intervention narrative begins with the activities that should bring about the desired changes.
- Finally, the right-hand column lists the assumptions that must be true for project success, but which are outside of the project's control.

Figure A Theory of Change for Pulse Producers

Enabling narrative	Intervention narrative	Assumptions
Infrastructure investments mean better access to markets Government/NGO market-development interventions contribute to price stability for profitable farming of pulses Other interventions (e.g. P4P programmes) increase demand (and so price) of pulses Health interventions (e.g. sanitation) improve general nutrition levels	**Direct Benefits** **Results** 1. Farmers produce, consume and sell pulses 2. Seeds produced and sold into the seed system 3. Increased supply of pulses for private sector to process pulse-based foods **Impacts** 1. Reduced food insecurity and malnutrition in southern Ethiopia 2. Increased incomes for participating farmers 3. Improved soil fertility	Favourable weather conditions Health environment allows for nutritional improvements through pulse consumption.
Government/NGO behaviour change campaigns encourage consumers to increase consumption of pulses. Increases in protein consumption are facilitated by increasing incomes in SNNPR Private sector actors exist to participate in seed distribution.	**Behaviour Changes** Farmers produce improved pulses, some produce pulse seeds Households consume some of the extra production **Reaction:** Large-scale adoption of chickpea as second crop (following main harvest) in southern Ethiopia; yields increased by 40%; income doubled.	Favourable weather conditions. No environmental factors disrupt production or distribution of pulses (infrastructure, weather…)
C: Awareness of importance of improved	**Capacity Changes**	

nutrition / soil fertility created by other interventions.	**Capabilities:** producers acquire new knowledge & skills (to increase yields, improve PHH, increase soil fertility) **Opportunities:** producers have more reliable markets for pulses/consume more pulses Producers require less chemical fertilizer **Motivation:** producers see a chance to increase their income and improve household nutrition **Reach:** 70,000 smallholders	Adequate demand for pulses allows for their profitable sale.
	Activities 1. Train farmers in improved pulse production and disseminate seeds to them. Women farmers, with smaller plots of land, given smaller seed packages (2kg). 2. Train subset of farmers in seed production and PHH. 3. Work with South Seed Enterprise to ensure seed producers have market for their produce. 4. Collaborate with Guts Agro to build pulse value chain from producers to processors.	Farmers, including women, have capacity (land, time) to participate in testing and training. No environmental factors prevent farmers from participating in training (e.g. weather, health etc.)

For this ToC, the main activities are the training of farmers in the production of the selected bean and chickpea varieties through the government extension system and existing farmers' groups. This was done through field agents training government extension agents, who then collaborated with farmers' groups and model farmers to disseminate improved farming techniques and new varieties.

Farmers who participated in training were provided with improved seeds, according to one of two distribution models. The first model involved the distribution of 2kg packs of seeds to farmers who only had access to smaller pieces of land. Women were given priority for these smaller seed packs of either bean or chickpea seeds, which were sufficient for 80 m^2 of land and would yield approximately 80kg of pulses. This yield was sufficient for (i) household consumption, (ii) saving some seeds for the next season, (iii) generating additional income.

Those who received the 2 kg seed packages for free passed an equivalent amount on to other members of their community after the first harvest rather than repaying the project. There was no regulation or waiting list governing this as the aim was to encourage informal seed distribution. Therefore, the women gave the 2kg seed to their neighbours either free of charge or at small charge or in exchange for another crop. This is now widely recognised as the most sustainable and affordable mechanism for seed management.[3]

[3] In a letter to the World Bank President the Oakland Institute urged the bank to stop the Enabling Business in Agriculture project which promotes the takeover of seed systems by multinationals. It stated that traditional systems are systems

The second model provided 25 kg of seed and required that 4–5 farmers cluster their land by contributing up to 0.25 ha each. Clustering was encouraged as it allows for disease and pests to be treated more effectively as well as facilitating the application of fertilizer. It was also thought that farmers collaborating together would assist each other in applying the new farming techniques learned.

Farmers trained in seed production were taught additional post-harvest handling skills to ensure that the seed produced was of adequate quality. These activities relied on farmers having the capacity to participate in the training as well as a conducive agricultural environment, e.g. reliable rains.

Finally, the project collaborated with the government-owned South Seed Enterprise (SSE) to ensure that seed producers would be able to achieve a premium for their produce, rather than having to sell seeds into the food chain. Likewise, links were built between farmers and Guts Agro so that farmers could sell their produce directly to a processor, while the processor likewise could cut out the middle men.

The project logic was that these activities would result in an increase in capabilities, namely pulse production skills, including techniques to increase yields, improve soil fertility and to minimise post-harvest losses; that farmers would benefit from the opportunity of more reliable markets; and that producers would be motivated by the possibility of increasing their income and improving household nutrition. This would result in behaviour changes, that would see farmers increase their pulse production and protein consumption — weather and environmental conditions permitting.

The direct benefits of these activities would therefore be a reduction in food insecurity and malnutrition in SNNPR as well as an increase in incomes for participating farmers. Farmers would also see the fertility of their fields improve. Finally, Guts Agro would have easier access to pulse supplies, while farmers did not need to worry about how to market their pulses.

Figure B Theory of Change for Improving Mother and Child Nutrition

Enabling narrative	Intervention narrative	Assumptions
Other health initiatives – e.g. deworming.	**Direct Benefits** **Results**: Mother and children consume more protein **Impact:** improved mother and child nutrition in southern Ethiopia	Benefits of nutrition improvements are visible to parents
Complementary foods being made available through other initiatives Greater nutrition awareness due to better education in schools	**Behaviour Changes** Rural households make complementary foods available to children and adults consumed more pulse-based food.	Parents have time to produce complementary foods for children Women have access to water and equipment necessary to produce new recipes
	Capacity Changes	

are maintained by farmers' own work to recycle and save seeds from their crops, and by farmer-to-farmer gifts, exchanges, and trade. Farmer-managed seed systems provide a rich diversity of seed, including varieties that are affordable and adapted to local environmental conditions. They are vital to support agro-biodiversity, food security, and resilience against climate and economic shocks (https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/world-bank-end-eba.pdf accessed 2.1.18).

C: Consumers have learned value of pulse-based complementary foods from other projects O: Women have more scope to make decisions owing to other interventions. M: Other interventions have increased awareness of importance of nutrition.	**Capabilities**: Rural consumers acquire new knowledge and skills in producing pulse-based complementary foods **Opportunities**: Protein-rich pulses available due to increased production (resulting from producer ToC) **Motivation**: Consumers want to see their children's nutrition improve **Reach:** 70,000 households in southern Ethiopia will be targeted	O: Women have control over resources necessary to produce complementary foods and new recipes M: No adverse agroclimatic events that detrimentally affect nutrition
	Activities 1. Teaching nutrition and pulse preparation techniques to women	

The project made use of local government structures, namely health extension workers (HEW), to bring nutrition education and pulse preparation techniques to rural women. HEWs work with communities to provide basic, preventative public health interventions that can be achieved largely through behaviour change. For example, they ensure that children are vaccinated, mothers attend their local clinic to give birth, and to improve basic water and sanitation at the community level.

Community structures exist to collaborate with HEWs. These include the 1:5 groups where households are grouped into fives with one leader and the Women's Development Army, which brings together groups of 30 women under one leader. The leaders of each of these groupings are volunteers who are trained by the HEWs and they pass knowledge on to the other members of their group. These structures are widely considered to have contributed significantly to health and sanitation improvements in rural Ethiopia in the last decade.[4]

The project made effective use of these structures to improve mother and child nutrition. The HEW in each participating community received training on the benefits of pulse consumption and better preparation techniques to make the pulses more easily digestible for children and adults. The HEW then trained women passing the skills to households. The assumption here is that there are no adverse environmental factors that would prevent these nutrition improvements from being achieved and felt by consumers.

Interactions between women and HEWs were expected to result in capacity changes, as women acquired new knowledge and skills in producing pulse-based complementary foods and that they would be motivated to do so in order to improve their children's nutrition. The increased availability of pulses in their communities, due to the first theory of change, provides an opportunity to put this new knowledge into practice. These capacity changes then result in behaviour changes, namely the cooking and consumption of more plant-based (pulse) proteins. The direct benefit of this would be improved nutrition, in particular a decrease in protein-calorie malnutrition.

2.2 Testing the Theory of Change

The Theory of Change for Pulse Producers

2.2.1 Activities

The project activities that would lead to an increase in pulse production were carried out as described in previous section and a total of 70,000 farmers were reached

[4] During a recent visit to Ethiopia, Christine Lagarde, the IMF Managing Director, praised Ethiopia's health sector success particularly improving the delivery and use of maternal health services. (www.preciseethiopia.com - accessed 22.12.17).

through the project. Relationships were built with Guts Agro to guarantee their supply chain and to assist some farmers in selling their products. A subset of farmers was trained in seed production for sale to South Seed Enterprises.

For this outcome, the greatest enabling factor for the project's success in training 70,000 farming households in SNNPR were the relationships built by agricultural extension agents with farmers. The project worked closely with extension agents to train them in pulse production and post-harvest handling, so that these neglected crops would be championed by the extension service. The participatory selection of pulse varieties (in Phase I of the project) was also greatly assisted by the extension service and its relationship with the model farmers who were chosen for this task. Involving farmers in the selection of varieties helped to increase farmers' trust and facilitated the project's task of encouraging pulse production.

2.2.2 Changes to capacity and behaviour

From the focus group discussions, it was clear that this resulted in the intended capacity changes: farmers expressed their appreciation for the training provided in improved farming techniques as this allowed for more productive uses of their land, leading to yield increases. This was particularly the case for chickpeas as these were planted after the main agricultural season and grown outside of the rainy season with the residual moisture remaining in the soil. This meant that farmers were able to harvest another round of crops in their annual production cycle without displacing other produce.

Farmers reported being taught a variety of skills including correct techniques for growing chickpea after the main planting season by using residual moisture in the soil, planting in rows rather than by broadcasting, using fertilizer and leaving roots in the ground after harvest to maximise nitrogen binding. Simple observation of raw chickpea trading on the streets of Addis Ababa and other towns shows that uprooting is still widely practiced. But project farmers realised that leaving the roots in the ground keeps the soil and fixes nitrogen better than uprooting.

Farmers likewise saw clustering as an opportunity as it facilitated, among other things, learning from each other, and hiring equipment for spraying chemicals in the event of disease outbreak. Project activities also resulted in improvements in soil fertility as a result of the nitrogen-fixing projects of the selected, improved pulse varieties.

Farmers were motivated by the prospect of producing more crops, increasing the amount of protein available to their families and many reported being very pleased with their decision to plant pulses. In many cases, farmers reported wanting to increase the area under pulse cultivation further. They talked of having been aware of the benefits of pulses for soil fertility and nutrition but they had not known how to make the most of this potential. For example, farmers had previously uprooted their chickpeas at harvest, rather than leaving the roots in the ground.

Thus, the expected behaviour changes were achieved: farmers produced a greater quantity of improved pulses and reported consuming some of the extra produce. Participants in our focus group discussions were aware of the benefits of including pulses in their diet and had learned how to better prepare these too (see the second theory of change for a more in-depth discussion of this).

2.2.3 Delivery of project results

As a result of behaviour changes, project results were largely achieved. Chickpea and bean markets were accessible to producers in SNNPR and farmers were able to sell their produce.

Some difficulties were experienced by seed producers, however. Some farmers complained of difficulties in selling their seeds to South Seed Enterprise, as its traders often did not visit farmers directly after harvest, forcing farmers to sell their seed into the food supply chain, thereby losing the premium commanded by seeds. This also means that the project's aim of increasing the supply of improved seed beyond distribution at community level was not fully achieved.

However, collaboration with Guts Agro, a private producers of pulse-based snack foods, was more successful. As a result, further markets were created for pulse farmers and Guts Agro was able to expand its range of snack foods. This partnership meant that new pulse-based snack foods were introduced to the urban market and were produced by the Guts Agro factory located in Hawassa town – the capital of SNNPR. Guts Agro's General Manager said that the company had been able to expand its supply networks and production of pulse-based

snacks, which are now being marketed in urban areas, as a result of the collaboration.

It is also worth noting that project results were negatively affected by El Nino and resultant climatic shocks in the first year. Some respondents reported that their crops had done badly in that year, despite best efforts to adhere to best practices. Interviewees from the Bureau of Agriculture confirmed that rainfall was indeed less than expected during that season.

2.2.4 Project impacts

Evidence from Phase I of the project show that nutrition education and pulse production resulted in increases in income and improved dietary diversity . In addition, respondents spoke of seeing an improvement in their own and their family's health as a result of producing and consuming a greater quantity of pulses during our interviews. Many also mentioned that they found these new pulses more easily digestible, especially when prepared as taught by the second component of the project.

Likewise, farmers stated their intention to increase their land under pulse production not only to improve their nutritional levels, but also to increase their families further. Many talked about having increased their income over and above their expectations and that they would aim to increase their income further in the coming seasons. Farmers also spoke of having witnessed improvements in the fertility of their plots of land where they had planted the improved varieties, especially where they had left the roots in the soil during harvesting, as taught by the project.

Theory of Change for Improving Mother and Child Nutrition

2.2.1 Activities

The project activities for this second theory of change were implemented as intended, with health extension workers being trained to teach leaders of the 1:5 groups and the Women's Development Army. The project activities resulted in 70,000 rural households (largely women) increasing their knowledge of nutrition, the importance of consuming protein and how protein uptake could be maximised through pulse preparation and consumption.

In addition to training rural women in pulse preparation, the project also collaborated with Guts Agro – a producer of processed foods – to create micro-franchise opportunities for female traders. 30 women were assisted to create two micro-franchise groups to sell the nutritious snacks produced by Guts Agro in SNNPR.

2.2.2 Capacity and behaviour changes

The women who took part in our focus group discussions confirmed that this training resulted in the expected capacity changes. Primarily, women gained skills and knowledge in order to produce complementary feed for their children and learned recipes that allowed them to include pulses more frequently in meals for the rest of the family too. Perhaps most importantly, they learned that meat could be replaced with pulses, thus saving the household considerable expenditures. Due to the activities carried out in the first theory of change, pulses were readily available, providing the necessary opportunity for women to apply what they had learned.

The women who took part in our focus group discussion were very motivated to improve their health outcomes by changing their diet and felt they had simply lacked the knowledge to do this previously. This was best articulated by one female participant who asked for a similar project to educate her on the benefits and preparation techniques for other crops, because "we do not know if we are using our other crops correctly". This opinion was expressed in various ways by our interviewees.

Capability, opportunity and motivation changes resulted in the anticipated behaviour changes: the women who participated in the trainings were able to provide their children with complementary foods (porridges made from pulses) and adults reported that they had increased their consumption of chickpeas and beans. Many women said that they had previously been aware of the importance of a diverse diet, for example, but they had not known about the role that pulses could play in achieving a more balanced diet. A dietary diversity exercise was conducted with two groups of women during our fieldwork. It showed the increased presence of chickpeas and other pulses in the diet and that efforts were being made to pay special attention to the nutritional needs of children (see appendix 2).

The 30 women involved in the micro-franchise groups acquired business and cooperative management skills.

2.2.3 Delivery of project results

In conclusion, this fairly simple intervention has increased the consumption of plant proteins by mothers and their children. Participants in our focus group discussions confirmed that they had adopted the new recipes and that these were a positive addition to their diets.

The micro-franchises achieved a turnover of 50,000 Birr and are estimated to have reached 50,000 households with their products.

2.2.4 Project impacts

Unfortunately, the evidence to demonstrate that these behaviour changes have led to improvements in nutrition levels of mothers and children has not yet been generated. Nevertheless, given the reported increase in the consumption of beans and chickpeas in project areas, it is reasonable to assume that the project will have had a beneficial impact on protein deficiencies.

3. Analysis

3.1 Sustainability and scaling up

3.1.1 Sustainability

The behaviour changes reported by farmers and those who attended the nutrition training have a high likelihood of being sustained, as they do not depend on external resources. Pulse producers should be able to sustain yield increases, provided they suffer no major shocks, and many spoke of expanding the area of land they had under pulses to increase their incomes further.

Likewise, those trained in better processing of pulses are likely to continue to follow the recipes learned, especially as they reported being able to see improvements in their children's health. The only hurdle identified to sustainable changes in eating behaviours is the additional water required to soak and cook pulses as recommended by the project's recipes. In both instances, the fact that pulse production and preparation did not required many additional resources facilitated their adoption.

The fact that the project collaborated closely with the existing extension service was key: it allowed for large number of farmers to be reached cost-effectively and built on the trust that many agents had built with their communities. It is less clear whether the changes within the extension system can be sustained, given the high staff turnover experienced by the service. New extension agents will not benefit from the training provided by this project, even if easy-to-use training manuals are available to them. Without support from the project, it is not unlikely that with time extension agents will focus on other areas of work. This means that farmers who have not yet benefited from the project may not receive the same or any training in pulse production. Should farmers encounter additional challenges in the future, such as new pests and diseases, they may also receive lower support levels. Similarly, health extension workers are also subject to high staff turnover meaning that nutrition lessons may also fade away over time. Ultimately, therefore, the sustainability of the project gains will depend on the political support for pulse production and nutrition education.

3.1.2 Scaling up

The project has succeeded in demonstrating that it is possible to bring new pulse technologies, to a large number of rural households in SNNPR. As this was done through existing government structures and by building relationships with key partners, the project has also achieved this in a cost-effective manner that is transferable to other areas in Ethiopia. The government has the intention to scale up some of the project's components through its own structures, particularly its nutrition education efforts. Government officials appreciated the assistance provided by Hawassa University staff in the course of the project and stated that they would benefit from such continued support in expanding the geographical reach of these interventions.

If activities to scale up production go ahead, some thought will need to be given to the ability of the market to absorb increases in chickpea and bean production. Currently, farmers report being able to find markets for (non-seed) chickpea, but not necessarily for the new variety of beans. Export markets offer some potential but without the necessary market linkages, this will remain out of reach for most farmers.

3.2 Specific Outcomes

The Scaling Up Pulse Innovation project is a well-designed project and its activities were carried out as planned and have, largely, resulted in the expected behaviour changes. Some of these were facilitated by the enabling environment as well as the project design. In particular, the project benefited greatly from the relationships built

by government health and agriculture extension services. As a result, this relatively small project was able to achieve its target of reaching over 70,000 farming households.

3.2.1 Food and nutrition security

The expected food and nutrition security goals were achieved due to the critical role of the health extension system. The health extension system was essential to project success, as it dovetailed well not only with project objectives but also with the work of the agricultural extension system. As a result of the community linkages and the trust built by HEWs, it was comparatively easy to change the consumption behaviour of pulse producing households. Thus, it appears that considerable increases in protein consumption and a concomitant reduction in calorie-protein malnutrition could be achieved.

The work previously conducted by the health extension system also contributed to project success: it has brought about a reduction in infant and child mortality, as a result of encouraging women to give birth at health centres, running latrine building projects and by providing deworming to under-fives twice a year. These changes not only built trust between HEWs and communities, but also resulted in improved health and nutrition outcomes that will have increased the utility of protein-rich meals for individuals. For example, children who are infected with worms will benefit less from increased protein consumption than those who are not.

3.2.2 Income security

Farmers increased their production of pulses as a result of this project, which led to increases in household incomes as well as improved nutrition. This was especially the case for farmers who participated in clustering and cultivated larger fields of haricot beans of chickpeas. However, even the women who had grown pulses only on very small plots of land reported that this was enough for household consumption needs and for a small amount to be sold. Market access and demand for pulses contributed to farmers' ability to sell their produce profitably.

The income increases experienced by chickpea producers were particularly important as these were grown outside of the normal seasons, meaning that they did not displace other plants and income sources.

The project also drew on the government-owned seed distributor – South Seed Enterprise – to facilitate access to seed markets by farmers, in order to increase farmers' incomes. This is the component of the project that worked least well, as SSE does not have the capacity to purchase seeds from geographically dispersed farmers in a timely fashion. There are no private sector actors in the seed sector who might be able to fill this gap.

3.3 Sustainable agriculture

Given decreasing landholdings per household in SNNPR, the project contributed not only to improving nutrition and increasing incomes, but also to the sustainability of agricultural systems. Pulses were chosen for this project due to their nitrogen-fixing characteristics. Coupled with the training in improved farming techniques – in particular not uprooting the crops at harvest – soil fertility improved on the farms of participating farmers.

Given the changing climate, farmers were also encountering pests and diseases that they had little experience of combatting. The project responded to requests for assistance with pests and diseases from participating farmers by providing additional training and inputs, where necessary. Some farmers, however, requested further assistance from the project with pest control.

3.2.3 Gender

The project created some meaningful changes in the lives of women in its intervention areas in two ways: It provided 2 kg seed packages to women farmers to experiment with growing pulses on land that was available to them. While this was not enough seed for a large plot of land, this was enough to provide women with the pulses needed for domestic consumption and to buy some additional household necessities, such as oil or salt. As little land was needed to participate through this mechanism, women were not excluded by requirements to own larger tracts of land.

Some women also participated in the other project components, namely clustering, by negotiating with their husbands for allocating 0.25 ha for pulse production. Due to the relatively large land size requirements, the number of women in this scheme was lower than the other (i.e. 2kg) scheme. Nevertheless, it was encouraging to find some women were able to negotiate with their husbands to contribute a piece of land to cluster with other farmers so that they too could benefit from the larger scheme.

In addition, a number of respondents stated that gender relationships were changing in SNNPR. This primarily

manifested itself in a more equal division of labour between men and women, and that women were being greater decision-making powers within their households.

Finally, 30 women participated in the micro-franchise programme run by Guts Agro: they have received business training and are trading in pulse-based foods, achieving a turnover of 50,000 Birr.

3.2.4 Unexpected outcomes

Women reported an additional benefit to the behaviour changes encouraged by the new recipes they were taught: soaking beans, which was previously not common practice, saved time and cooking fuel, beyond making the pulses more digestible. On the downside, this technique required more water, which in the few communities without a reliable or affordable water supply represented a noteworthy drawback.

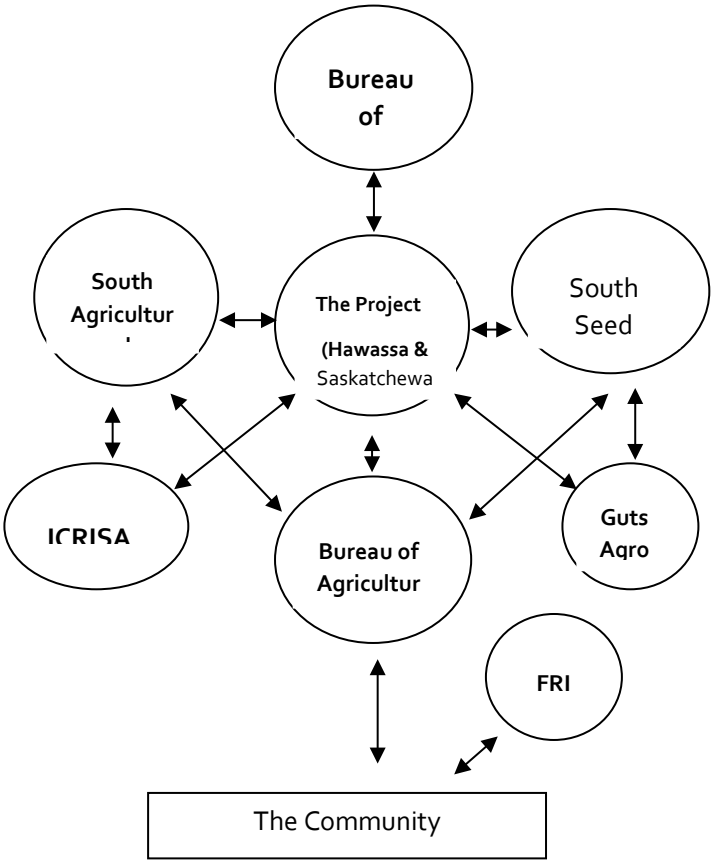
The desire by farmers to increase the area of land dedicated to pulses, especially chickpeas, was unexpected. While limited seed availability may constrain just how much land they can put towards the production of chickpeas, it is likely that in the medium-run production will increase further in project communities. Further, farmers not currently participating in the project voiced the desire to begin producing pulses as they had seen the benefits experienced by their neighbours.

3.3 Research partnership and policy influence

3.3.1 Research partnership

While not visible in the theory of change, the successful implementation of project activities required a great deal of relationship building by project staff at Hawassa University. The project leadership succeeded in persuading a great number of actors to contribute to the project's success, sometimes against their initial inclinations. The project's success owes a great deal to the relationships built with the Women's Bureau, the Bureau of Agriculture, the Ministry of Health's nutrition department, and other research institutes. The relationships between different project actors are represented below.

Figure C Project relationships



The Deputy Bureau Head of Agriculture commended the project for having achieved a large amount with a relatively small budget and over a relatively short timeframe. He attributed this largely to the coordination skills of staff at Hawassa University and their willingness to collaborate with a wide range of actors to ensure the project's success. Reportedly the main challenge here was managing the expectations of partners, who expected to be paid for their contributions to the project. Government employees, including extension agents, for example, wanted additional payments for their participation and needed to be incentivised in other ways, including the establishment of scholarships for those who excelled at their work for the project.

These relationships allowed for research findings to be incorporated into the extension system. Bringing new technologies and research findings to bear on the extension system is often a challenge in countries with low agricultural productivity. One of the contributions of this project has been to demonstrate how this can be done. The project made effective use of the university structure of 'teaching-research-community service' instead of creating a new structure which often is the case with projects. The structure allows staff and students to

carry out research within a community where problems have been identified through a baseline. The research findings are fed into the SARI and Bureau of Agriculture for follow up. This is an excellent demonstration of research-extension linkage that the public sector has been struggling to achieve.

The relationship between the University of Saskatchewan and Hawassa University was integral to the project's success. The partnership between the two universities started out with a relatively narrow focus on improved soil fertility through pulse production and has expanded with CIFSRF funding, first to address the question of how to bring new varieties to farmers and then how to ensure that farming families consumed the extra protein produced.

As the University of Saskatchewan has a large breeding programme that serves the province's farmers, the Canadian team was initially able to bring expertise in building relationships with and responding to farmers' production needs. Later on, the University of Saskatchewan brought its nutrition experts into the project to build capacity at Hawassa University in this discipline.

In both disciplines, Hawassa University was supported by its partners in Canada through exchange visits, between staff as well as students. Both masters and PhD students were supported by and trained at the University of Saskatchewan, some of whom returned to Ethiopia to take up positions in soil science and nutrition.

At Hawassa University, the partnership resulted in increased expertise in the area of nutrition. As a result, a greater number of students could be trained, which resulted in a number of research projects to test the effectiveness of using health extension agents to train rural women in food preparation and better use of the food resources available to them.

Equally, the University of Saskatchewan learned a great deal from the partnership. For example, the soil scientists from Saskatchewan found that the rhizobia in local Ethiopian varieties fixed greater quantities of nitrogen than Canadian varieties and were able to take these findings back to their students.

3.3.2 Policy influence

Scaling Up Pulse Innovation made an important contribution towards strengthening the link between research and extension services. Not only were relationships built between actors along this chain, but a previously neglected group of crops - pulses - moved up the policy agenda at regional and federal levels through the pulse platform. SUP's Project Coordinator, in fact, became the chairperson of the National Pulse Platform, which has also contributed to this endeavour. The haricot and chickpea extension package written by the project may be integrated into national extension curricula as a result.

Appendix 1: List of interviews

Date	Interviewee	Type of Interview	No. of participants	Location
23/10/2017	Project Team: • Gender Programme Lead • Acting Coordinator • Agricultural Component Lead • Research Assistant • Nutritionist	Meeting	5	Hawassa University Campus
24/10/2017	Women who participated in nutrition training	Focus Group Discussion (FGD)	14 women	Hawassa Zuria Dore Bafano Woreda, Labo Koromo Kebele
24/10/2017	Pulse farmers	FGD	8 women 10 men	TenkakaHumbulo
25/10/2017	Women's chickpea production cooperative	FGD	14 women	Mirab Badwacho Woreda
26/10/2017	Health extension workers	Interview	3 female HEW	Hadiya Zone Taba Kebele
26/10/2017	Women who participated in nutrition training	FGD	11 women	Hadiya Zone Taba Kebele
26/10/2017	Chickpea and bean seed producers	FGD	8 men	Hadiya Zone Taba Kebele
26/10/2017	Chickpea and bean producers	FGD	5 men 7 women	Damut Woide, Kindo Koyo
27/10/2017	Seed producers	FGD	5 men 2 women	Yimarwacho, Meskan, Butajira Zone
27/10/2017	Chickpea seed producers	FGD	8 men	Gugeti 1, Sodo Zuria zone
28/10/2017	Dr. Sheleme Beyene	Interview		Hawassa
29/10/2017	Deputy Head of Agriculture, Bureau of Agriculture	Interview		Hawassa

29/10/2017	Maternal & Child Health & Nutrition Service Core Process Owner, Bureau of Health,	Interview		Hawassa
30/102017	Dr. Tesfaye Abebe, VP, Hawassa University	Interview		Hawassa
30/10/2017	Manager, South Seed Enterprise	Interview		Hawassa
30/10/2017	Research Manager, Southern Agriculture Research Institute	Interview		Hawassa
31/10/2017	Agriculture, economics and nutrition students	FGD	3 women 5 men	Hawassa
02/11/2017	Dr. Tilahun Amede, Project Lead & Country Director, ICRISAT	Interview		Addis Ababa
2/11/2017	Engidu Legesse, General Manager, Guts Agro	Interview		Addis Ababa
3/11/2017	Coordinator, Farm Radio International	Interview		Addis Ababa

Appendix 2: Dietary diversity exercise

Taba Kebele, Women BBC Group Discussion

26 October 2017

Total 10; 6 volunteers selected for this exercise

Dietary Diversity of selected households based on 24 hr recall

Facilitated by Amdissa Teshome

	25.10.17			26.10.17	Do you have children?
	Breakfast	Lunch	Dinner	Breakfast	
1	Boiled beans and wheat with coffee	*kita* made of maize and wheat flour (mixed) with cooked cabbage.	*Injera* made of *teff* and maize flour with sauce made of lentils and field pea powder.	*Kolo* (roasted maize) with coffee	Yes
2	*Kolo* made of wheat and field pea with coffee	*Godere* (taro) with coffee	*Kita* made of maize flour with cabbage	Adults*: Kolo* (roasted maize) with coffee Children: *Injera* (made of *teff* and maize flour) with sauce made of field pea	Yes
3	*Kolo* (roasted maize) with coffee	Sweet potato with coffee	*Kita* made of maize flour with potato and cabbage	Adults: *Kolo* (roasted wheat and maize) with coffee Children: *Kita* with potato	Yes
4	Boiled bean and maize with coffee	*Kita* made of maize and wheat flour with cabbage and cheese	*Kita* made of maize and wheat flour with milk	Adults: Bread (purchased) with coffee Children : *kita* with milk	Yes

5	Boiled bean and maize with coffee	*Kita* made of wheat flour with cheese	*Injera* made of *teff* flour with fried potato	Adults: Chick pea *kolo* with coffee Children: *kita* with milk	Yes
6	Roasted chick pea and maize with coffee	*Kita* with milk	Sweet potato with hot pepper	Roasted chick pea and maize with coffee	Yes

Hawassa Zuria, Dore Bafano Woreda, Labo Koromo Kebele

24 October 2016

Women Group Discussion (Total 15; 5 selected for this exercise)

Dietary Diversity of selected households based on 24 hr recall

Facilitated by Amdissa Teshome

	23.10.17			24.10.17	Do you have children?
	Breakfast	Lunch	Dinner	Breakfast	
1	Boiled bean	*Kocho* with beans and cabbage	Maize *kita* with milk	Bread made of mixture of maize and wheat (adults take dry; children with milk)	Yes
2	Adults: Kolo (roasted green maize) with coffee Children: maize *kita* with milk	*Kocho* with boiled and spiced haricot beans	*Enjera* (teff & maize mixed) with lentils sauce	Kocho with coffee	Yes
3	*Anbasha* (bread) made of wheat flour with tea	*Kurke* (maize flour mixed with oil, onion and cabbage; rolled and boiled)	Maize porridge with milk	*Kolo*: Green maize roasted Biscuits for children	Yes
4	Adults: kolo (roasted green maize) with coffee	Wheat *kita* with cabbage	*Kocho* with bean sauce	*Kolo*: Green maize roast	Yes

	Children: *Kurke*				
5	*Kolo* (roasted green maize) with coffee	*Kita* (thin bread made of maize) with milk	*Kocho* with bean sauce	*Kita* (maize bread) with coffee	Yes

Notes:

Definition of local terms:

Kita – thin bread (similar to pita bread) made of cereals

Injera - soft pancake style bread commonly made of teff flour but can also be mixed with maize or wheat flour.

Kolo – roasted grain mainly maize, wheat, chick pea, field pea or a mixture one or more of these.

Food groups

A food group is a collection o foods that share similar nutritional properties. Food groups range from 6 to 16 depending on which guide is referred to. The most common food groups are fruits, vegetables, grains/beans/legumes, protein (meat, eggs etc), dairy, confectionary, water.

In 24 hours, an individual/household is advised to consume at least four groups. By this standard, the diet of the two groups we consulted is dominated by cereals or grains; chick pea/beans are well represented; dairy hardly mentioned; egg and fruits and vegetables completely missing.

Appendix 3: References

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